Chapter 2 Conceptual Basis of Design

This chapter begins with a brief review of the history of office design, from the origin to the Quickborners' "office landscape" in the late 1940s to the organizational and technological changes of today. Next, to understand the challenges of today's workplace, a review of the research on the new workplace patterns is made to discuss the new concepts and issues. Then, examples of workplace neighborhood projects are discussed. Also, a review of the "neighborhood" concept and an analysis of the relationship of neighborhood and workplace neighborhood is then made. Finally, a brief review of the research of the workplace human interaction is presented.

<u>Historical Review and Workplace Design Concepts</u>

Originally, an office could be just a bench and a table in a room of a house. (Sundstrom & Sundstrom, 1986). As industrialization spread and the office staff increased, large office areas emerged. One of the typical large offices was named the "bullpen" (see figure 1). In this type of space, staff workplaces were arranged in rigid grids of desks in open areas. Executives occupied much of the prime perimeter space in enclosed, windowed offices leaving the bullpen without windows (Harris, Engen & Fitch, 1991). Another type of large office space called the single-office plan, maintained the same segregation of executives in closed, windowed offices, but placed staff members in several-person enclosed spaces instead of bullpen areas.

In the early 1900s, an executive core plan developed (see figure 2). In this layout, staff members were moved to the perimeter of the office. The executives were located in the center of the space and were still provided with enclosed, individual offices (Harris, Engen & Fitch, 1991).

A popular open-plan design concept called "Bureaulandschaft" or "office landscape" was originated by the Quickborner team in Germany in the late 1940s (Sundstrom & Sundstrom, 1986). In this concept, there was no private office, furniture was placed at odd angles with asymmetrical spacing, and large potted plants were used to separate the areas. The designers using this approach believed that completely open-
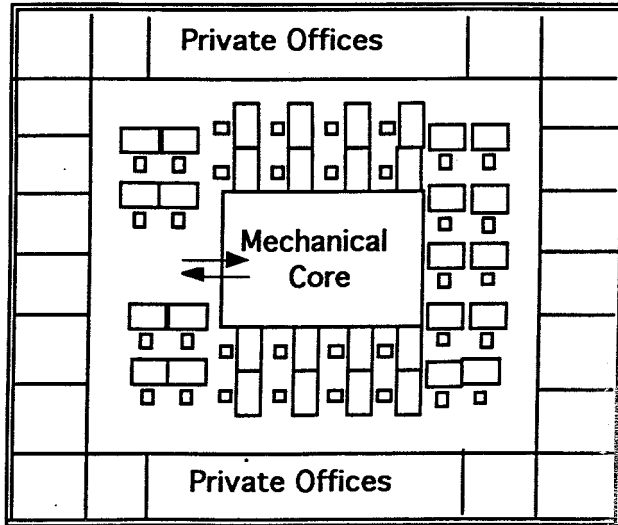
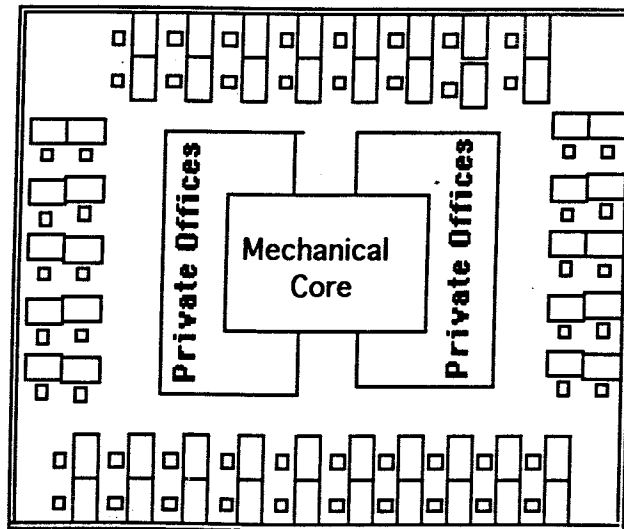Figure 1. Example Bullpen Office Plan (McLain-Kark, 1996)

Figure 2 Example Executive Core Office Plan (McLain-Kark, 1996)

offices were more efficient and avoided physical status symbols. Privacy was then

subordinate to the convenient conversation and the circulation of paper. To regain some

privacy, the Quickborner team eventually added curved, free standing partitions about 5

feet high, as shown in Figure 3 (Sundstrom & Sundstrom, 1986)

Figure 3. Office Using the Bureaulandschaft Design Concept (Sundstrom & Sundstrom, 1986, Reprinted by the permission of Cambridge University Press.)

In the 1950s and 1960s, the human relations movement had revolutionized the philosophy of management (Mcgregor, 1960). Managers began to see the importance of two-way communication between workers and supervisors, as well as the benefits of worker participation in decisions. The accessibility provided by open-plan offices seemed to promote all of these ideas: communication, participation, and equality (Sundstrom & Sundstrom, 1986). Initially, free-standing furniture was utilized in open-plan offices. This type of furnishing soon gave way to workstations, or systems furniture, where worksurfaces and components could be mounted onto panels. In the late 1960s, the development of Herman Miller's Action Office System lead to the widespread use of office systems furniture (Harris, Engen & Fitch, 1991).

However, controversy surrounded the open-plan office. Although it can be argued that the open-plan office is economic, flexible and convenient for communication, some employees complained because they could not have an office to signify their status; others complained about the noise of co-workers' conversation, the lack of privacy, and the movement of people. By 1980, many office planners and designers had become disenchanted with purely open-plan offices and had begun to use private offices in combination with open-plan offices (Sundstrom & Sundstrom, 1986). Again, status acted as an important role in office design. Each company often develops space standards or norms according to its organizational hierarchy. In a typical space standard, positions on certain organization levels should have the same size offices, as well as the same amount and type of furnishings. A private office with a large window, a tall-back leather chair, and a large wooden desk are typical standards for a manager's office. The next corporate level may have a smaller office with a smaller desk, or may only have a workstation in open-space instead of a private office. Unless there are specific requirements, the lower the status, the smaller the space. The design constraint is obvious. After having satisfied all the requirements for various sizes of personal workspaces as dictated by the space standard, there is usually not much space left for providing other kinds of spaces, such as conference rooms, informal conversation areas, and the like. "Because of budget constraints these tend to be seen as luxuries to be tacked on after everyone has been given a place" (Becker & Steele, 1995, p. 34). The design becomes even less functional when the workers participate in more collaborative work than individual work.

Pressures for Change

In the 1980s and early 1990s, 5% of American corporations were responsible for 65% of office workers (Barnes, Nicholson & Simko, 1996). Today, the picture has changed dramatically with corporate downsizing, the increased use of contract workers and consultants, and the tendency of companies to split up into physically scattered business units (Barnes, Nicholson & Simko, 1996).

Each office, therefore, has fewer people, and they, in turn, come into more frequent contact with one another. Fewer intermediaries -- secretaries, assistants, and the like -- means more direct contact. The rigid hierarchy of the conventional corporation is gradually giving way to the flexible dynamic of small business. (p. 222)

One of the results of the organizational restructure is that more and more work is undertaken collaboratively. In the past, 85% to 95% of the office work was done by individuals working alone, coming together with others almost exclusively to pass a work product along for approval, for schedule, or for review (Barnes, Nicholson & Simko, 1996). In contrast, 35% of work today is accomplished by groups, actively creating together. Teams are assembled and rearranged frequently, drawing together individuals from different departments, disciplines, and levels of corporate hierarchy. A group may expand from a core of five, to twelve or more, as needed (Barnes, Nicholson & Simko, 1996). The value of an individual's contribution is not necessarily related to his or her status, but related to what truly gets done.

Changes in the workplace occur not only because of the organizational restructure, but also because of the proliferation of information technology. Office workers at all levels have become more dependent on technology. Ready access to telephone and data lines and to a power source is essential for both individual and collaborative efforts (Barnes, Nicholson & Simko, 1996). Although the size of the information technology equipment is shrinking, today's workspaces are more heavily loaded with office technology because the functional variety of this technology is growing rapidly. For instance, there are high-speed fax machine, computers with multimedia programs, CD-ROMS, pagers, cordless and celluar telephones, telephone numbers attached to the person, electronic mail, worldwide data base and networks, etc (Becker & Steele, 1995).

The proliferation of information technology offers opportunities for practicing new workplace design concepts, such as hoteling, alternative officing, and virtual office

(Becker & Steele, 1995). Meanwhile, it also sets up new requirements for workplace design, such as more power and data accessibility, and more space for new equipment.

New Workplace Patterns

In responding to the changes in organizational structure and information technology, much research has been done on the exploration of the new workplace patterns today. A "total workplace" concept was developed by Becker and Steele (1995):

> . . . the workplace is not simply one's desk, office, or workstation in an office building. It is also the cafeteria, the conference and break rooms, the project room, corridors and water fountains, the fitness center. It is all the places in which one works. . . organizations need to conceive the workplace as a system of loosely coupled settings that are linked by the physical movement of people and the electronic movement of information in a way that enhances the organization's ability to meet its fundamental business objectives. (p. 14 -15)

Becker and Steele (1995) also summarized old versus new assumptions of organizational health as follows :

OLD Assumptions	NEW Assumptions
One person, one place "owned" by them exclusively.	One person, a number of different places used jointly.
Work happens at the desk, the terminal, or in meetings.	Work happens all day long wherever the person happens to be, in many different spots.
Facilities are best used as rewards or perks for one's level in the system.	Settings are tools in which things get done, and as such are too expensive to use as status symbols
Workplace should project a certain image to visitors.	Workplace that are well designed for their users will inherently project the right image.
Personal choice by users about facilities is too slow, complicated, and potentially chaotic.	Appropriate choices by users result in better settings and stronger commitment to using them all

(Continues)

Saving on space costs is always a gain for the organization because it improves the bottom line.	Space costs should be controlled without compromising the best achievement of overall objectives, which is the organization's reason for existence.

(p. 25).

Based on these assumptions, the high-performance workplace is not necessarily a single place, but an integrated workplace system that simultaneously considers:

How decisions about the nature of physical settings, information technologies, work and business process, and corporate values and philosophies can be shaped in light of work force demographics and external business conditions to enhance the long-term competitive position of an organization. (Becker & Steele, 1995, p. 26)

Work gets done neither in a single place, nor in a single way. The concept of "real work" today shifts the focus from a narrow definition of what is a professional way to work to a principle that states people are different and work effectively in different ways (Becker & Steele, 1995). Within this concept, there is no assumption that sitting in a lounge chair with one's feet up to conduct a telephone conversation, or to read a book, or to just think about a problem, is improper. Conversely, there is no assumption that one should work in these positions, either. Managers will focus on real productivity; what actually gets done as opposed to what people look like doing it (Becker & Steele, 1995).

In terms of another aspect of "real work", Becker and Steele (1995) pointed out that most companies still regarded informal communication as a waste of time instead of a form of work. Efficiency was previously defined as focusing directly on the task, such as typing, telephoning, writing a report, reading a memo, or participating in a scheduled meeting. However, problems in today's world are much more complex, and the expertise needed to resolve them is more diverse. Allen's (1977) research shows that performance is related, in part, to the number of informal contacts people have with others outside their own discipline. Stimulating face-to-face communication among persons whose jobs

do not require interaction is helpful for enhancing creativity. Informal interactions can also create good working relationships through increased trust and greater tolerance fostered during the process (Becker & Steele, 1995). Herman Miller Corporation (1989) regards social interchange as an important aspect of chance encounter:

> It puts people at ease and paves the way for talking about work-related subjects in an informal way. One person updates another on what happened in a project meeting. Someone puzzling over a problem on the way to refill his coffee cup runs into someone from another department, asks an inspired question, and returns to his desk with cold coffee, but with the germ of a great idea. (p. 16)

Also, communication and interaction play important roles in the "rugby" model that Becker and Steele (1995) suggested as the workplace model today. The rugby model brings all the players in the process together as the team moves towards the goal. The whole team is in the game all the time, so that decisions in different phases are known and tested for consistency and compatibility. "Communication in the rugby model is on the fly, in the halls, on the stairs, at lunch, in the locker room" (p. 70). In contrast, in the traditional workplace model, "relay-race" model, each function or discipline does its work and then tosses it over to the next group until it is finished. "In the relay-race model, communication is in the conference room -- planned, scheduled, predetermined" (p.70).

Research by Knoll International (1995) indicated another workplace model. Knoll investigated the evolution of the workplace among twenty progressive companies from across North America. Selected participants represented major corporations from high-tech and technology intensive businesses, as well as innovative manufacturing companies. The research results indicated a significant shift away from the traditional workplace model toward a new workplace model:

Traditional Workplace Model		Emerging Workplace Model
Reinforce management hierarchy	-------------	Support work processes
Vertical organization structures	-------------	Team-based networks
Technology growth	-------------	Technology proliferation

Real estate redundancy ------------- Alternative officing

Complexity ------------- Simplicity

(Barber, 1996, p. 245).

       The Knoll (1996) research also found that office reconfiguration caused by organizational change had become a constant for most corporations. Half of the companies researched reported that "they reconfigure furniture every six months or less, and if they are not reconfiguring furniture, they are moving people" (Barber, 1996, p. 246).

       According to Steelcase (1993), "work settings" refer to "spaces, furniture, technology, and support tools and their work-specific arrangement within the office environment" (p.5). Each work setting is operation-oriented and based on a definition of the functional needs of workers. "One person may work in multiple settings to effectively accomplish a day's or a week's work" (Steelcase , 1993, p.7). This work setting concept was used by Douglas R. Parker of Steelcase (1996) to describe the movements of the workplace "shape and face" in responding to the evolving business environment:

From   **To**

org. chart based -------------- work process based

hierarchy/status -------------- work requirements

one workstation per person -------------- work setting with multiple workspaces

assigned spaces -------------- shared spaces

single use/regular time -------------- multiple uses/any time

individual spaces -------------- range of settings

private or group -------------- private AND collaborative

workstation focused -------------- workplace focused

facility controlled -------------- user controlled

(p.284).

From this research review of the workplace patterns, the major trends of today's workplace can be clarified: focusing on productivity and work process itself, encouraging human interaction and self-expression, and emphasizing flexibility and muti-function. It is a challenge for interior designers to transform this information into workplace design practice.

Workplace Design Projects Using a Neighborhood Concept

Some interior designers have begun to explore the potential of neighborhood concept in meeting the requirements of the workplace today. The first projects utilizing the workplace neighborhood concept were industrial makeovers. The renovation and conversion of the Nortel North American Headquarters (Shirley & Brunner, 1996) is one of these. The site is a 33-year-old switching manufacturing complex at Brarmalea, Ontario, Canada. The project involves the renovation of existing office space as well as converting over 300,000 square feet of high-bay manufacturing space to a high quality office environment for over 2,600 employees. As required by the business goal, the manufacturing image of the Bramalea facility needed to be transformed into a future-focused global business headquarters. The past examples of this kind of industrial makeovers have been little more than "carpet parking lots" (Shirley & Brunner, 1996). Thus, the employees' perceptions of the project were not positive: extra travel time, rigid and plain facilities, and a dull and uniform work environment. There was a need to improve the employees' perception by creating a more humanistic environment.

Facing all these challenges, the designers thought that the solution might lie in using the metaphor of a city, because this approach would merit what good planning does for a city -- providing order, clarity, scale, sense of place,and orientation. Thus, the concept of a city gave a theoretical framework for solving many of the design issues. The vast floor area was broken into public and private spaces. The public realm resembled conferencing rooms, cafeterias, corridors and hallways -- anything employees shared. The private spaces were executive offices and individual workstations. Then, the two types of spaces were mutually organized into discernible neighborhoods. There were four

predominant neighborhoods in the city. Each was identified by the space to which it was affiliated, and had its own characteristics (Shirley & Brunner, 1996). The design as described below began with determining the location and the typology of the major public spaces and the spaces of the private realm were then developed accordingly.

> The main spatial sequence begins with the lobby space immediate to the main entrance and connects the main interior space by means of two avenue-like corridors. Acting in the manner of an actual plaza, this space is surrounded by the visitor, conferencing, and health centers -- the civic or public buildings. The technology of Nortel is celebrated within all public spaces, since it is the iconography which unifies the office culture...These primary public spaces, along with the main cafeteria, are connected together by a clear nexus of boulevard and street-like corridors. (Shirley & Brunner, 1996, p. 217)

To avoid sameness, a variety of materials and patterns were used to develop landmarks for recognition and identity. The relentless "grid" of the plan was broken by the introduction of a "whimsical way", or a meandering path. The designer reminds people that they should realize that although the goal of the industrial makeover is business driven, it takes vision and commitment to create a humanistic work environment.

The Maingate Complex of Disney World (Geran, 1996) is another example of this kind of project. The site is a huge abandoned shopping mall which is 250,000 sq. ft. and 20 miles away from the three theme parks in Orlando, Florida. Move-in plans called for the confluence of 1,500 staffers from three major divisions plus numerous sub-groups previously housed in leased offices nearby. Three neighborhoods were designed according to construction sequence and tasks. They were Creative Entertainment (development of story books for animated presentations), Sales and Marketing and Attractions Merchandising (search for and buying of promotional tie-in commodities featuring Disney's trademarked characters on merchandise). Each neighborhood was concentrated in its own sector with individual entry.

Though configuration and refinements vary to conform with spatial diversities, in every instance the plan adopts the matrix of a classic city grid. All in all, there are neighborhoods, community areas, parks, major arteries and superhighways pinwheeling around the atria to serve as major feeders into the complex. . . The space plan and circulation layout not only trace logical transit routes but also, it is said, bolster interaction among staff and customers. (Geran, 1996, p. 124)

In the above examples, the neighborhood concept was used within the context of a city metaphor due to the scale of these indutrial makeovers. Thus, the neighborhood concept was not discussed as much as the city metaphor. In the next two workplace design projects, the neighborhood concept was applied in the design, and also discussed in detail.

When it was time for MCA Music Publishing to have new office space in West Los Angeles, they wanted to have an artist-friendly environment instead of a universal lot (Anaya, 1996). The new workplace was planned to give each of the 65 staffers an appropriate workplace and foster interaction. The design idea was that the workplace would make people comfortable, as they were in a home or in a garden, and people had to be able to both stand alone and feel part of a community. One corner of the rectangular space was used for a sound studio, and the rest of the space was divided into four neighborhoods, clusters of angular enclosures separated by shifts of floor level and by narrow streets that radiated off a circular "living room".

Each neighborhood is subtly varied in character, from serene to sober to lively, according to the jobs that are done there. Individual tastes are satisfied by spaces that are skeletal or enclosed, 'roofs' that are flat or tilted, and sliding French doors that can be opened or shut at will. Meeting rooms are slotted in-between the workstations, and a stepped wood platform encourages casual get-togethers. The social hub is the living room; with its three-quarter circle of upholstered benches and state-of-the-art audiovisual system. The surrounding work surface provides

temporary workspace for staffers who are usually on the road, and the whole area

serves as an amphitheater for visiting bands. (Anaya, 1996, p. 78)

Another example that applied the "neghborhood" concept is the Steelcase

Leadership Community. The aim of this project was to turn its executive quarters into a

work environment designed to support the fluidity of movement among team members

and accommodate the various types of teaming activities (Nasatir, 1996). The idea was

that a company was like a community where citizens shared in each other's problems,

where the whole was more than the sum of its parts. It would "foster learning, effective

communication, spontaneous interaction and effective decision-making" (Graziano, Heide,

& Steele, 1996, p. 240)."

The community occupied by 44 people (executives and their assistants) consisted

of several neighborhoods arrayed around a core space at the floor's heart. The core space,

called "the center" was a circular-shaped space where computer-generated, real-time

information would be projected on several large screen displays around the space. It was

designed for company executives to receive the latest information and exchange opinions

on key business issues (Nasatir, 1996). Each neighborhood of the community consisted of

several different types of environments, some more private than others, some for

scheduled occupancy and some for home-bases. Each neighborhood was designed to

accommodate the various types of activities in the work process, providing a wide range

of work settings (Nasatir, 1996). A radio frequency telephone system was equipped to

keep team members connected while traveling the floor (Graziano, Heide, & Steele, 1996).

The above review of the projects utilizing the workplace neighborhood concept

indicates that the workplace neighborhood concept can be a help to meet many of the

requirements of today's workplace. Actually, it is not a brand new idea that social

interactions can be fostered and encouraged by the design of neighborhood space. City

planners and architects have worked on the theory of neighborhood space design for a

long time and have many results for interior designers to learn.

Neighborhood and Workplace Neighborhood

It is necessary to have a look at some basic concepts in the neighborhood theory developed by city planners and architects. In Hester's (1984) <u>Planning neighborhood space with people</u>, neighborhood space was defined as a "territory close to home, including houses, churches, business, and parks that, because of the residents' collective responsibility, familiar association, and frequent shared use, is considered to be their own" (p.10). This sense of "own" means symbolically owned by every member of the neighborhood, but not truly owned by any specific person as an individual. Hester (1984) named this idea as "collective-symbolic ownership" which would increase as the frequency of use and intensity of involvement increase.

<u>Use of neighborhood space.</u> Residents frequently share the use of these neighborhood spaces and can be involved together in acquiring, planning, and changing them. How the neighborhood space is used depends on the activity occurring there, such as:

> Work (delivering mail, repairing the automobile, keeping shop); leisure activities (taking a walk, playing football, jogging, bicycling, hanging out, sitting on the front porch, swinging, playing checkers, throwing a Frisbee, dancing); political gatherings (protesting a city policy, planning a park, closing a street); educational projects (showing a class the effects of soil erosion, identifying trees); and movement from place to place (walking to work, driving to the grocery). (Hester, 1984, p.15)

Those activities require different types of spaces: structured or unstructured; specific or unspecific. Meanwhile, those activities can be done by a single person, a small group, a medium size group or a large group (Hester, 1984) (see Figure 4).

Figure 4 table with column headers:

ACTIVITY	Single Person, Structured or Unstructured Setting Place Specific	Single Person Moving from Place to Place	Small Group, Unstructured Setting Place Specific	Small Group Moving from Place to Place	Small Group, Structured Setting Place Specific	Medium Size Group, Unstructured Setting – Place Specific	Medium Size Group Moving from Place to Place	Medium Size Group, Structured Setting – Place Specific	Large Group, Structured or Unstructured Setting Place Specific
SOCIAL ECOLOGY CHARACTERISTICS									
Working	●	●→	●●●	●●●→					
Leisure	●	●→	●●●	●●●→	(●●●)	●●●●●	●●●●●→	(●●●●●)	(●●●●●)
Political						●●●●●	●●●●●→	(●●●●●)	●●●●●
Education			●●●					(●●●●●)	
Moving		●→		●●●→					

KEY: Diagrams indicate general spatial arrangements

→ Movement

●●● = Persons in unstructured setting
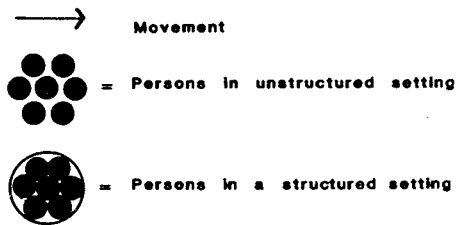
(●●●) = Persons in a structured setting

Figure 4. Generalized Neighborhood Space Use (Hester, 1984, Reprinted by the permission of Randy Hester.)

Human interactions in neighborhood space. Research also found that the way people feel about and interact in a space is just as important as what they do in that space. Thus, interactions and feelings should be regarded as determinants of the neighborhood space (Hester, 1984). Hester (1984) defined "interaction setting" as a space that is suitable for or encourages social interaction. It implies that the environment is perceived not as a setting for an activity, but rather as a setting for social exchange. The interaction settings can be classified as follows (Hester, 1984):

1. Inclusive interactions setting: provide a small space where a limited number of people can form an in-group, often in a circle, and encourage cooperation among the users of the space.

2. Face-to-face interaction setting: provide a space suitable for face-to-face social exchange, and encourage corporation among the users of the space.

3. Exclusive interaction setting: leftover spaces that result from an inclusive interaction setting. This space is often a conflictive setting, putting the inclusive group against the exclusive group.

4. Parallel interaction setting: generally prevent or discourage social exchange by forcing people to be arranged side-by-side.

5. Congruent and incongruent interaction settings: allow observation of behavior of a role model and either the acceptance or rejection of that behavior.

Neighborhood development. In environmental design, it has been hypothesized that in any situation an individual attempts to organize his physical environment to maximize his freedom of choice. Thus, any setting that provides a wide range of alternatives would contribute to one's psychological comfort. However, a wide range of alternatives can sometimes produce a feeling of confusion, uncertainty, ambiguity, and discomfort (Osmond, 1970).

According to this theory, a place must have complexity to allow for diverse activities, however, there must also be a center where the main circulation routes cross, and where people pause and meet. The center is the climax that provides the order of psychological security while the complexity provides the new experiences (Hester, 1984).

Alexander's (1977) pattern language of the "activity node" in neighborhood clearly described how these centers form and relate with other spaces. To create this concentration of people in a community, facilities must be grouped densely around very small public squares which can function as nodes - with all pedestrian movement in the community organized to pass through these nodes. Such nodes require four properties.

First, each "node" must draw together the main paths in the surrounding community. Second, to keep the activities concentrated, it is essential to make the squares rather small. A square of about 45x60 feet is recommended. Third, the facilities which are placed together around any one node must function in a cooperative manner, and must attract the same kinds of people at the same times of day. Fourth, these activity nodes should be distributed rather evenly across the community for equal accessibility. "In this way a contrast of 'busy and quiet' can be achieved on a small scale, and large dead area can be avoided" (p.164-166).

Alexander (1977) also described the steps to create these activity nodes (see Figure 5): First identify those existing spots in the community where public activities concentrate. After that, modify the paths in the community to bring as many of them through these spots as possible. "This makes each spot function as a 'node' in the path network. Then, at the center of each node, make a small public square, and surround it with a combination of community facilities and shops which are mutually supportive"(p. 166-167).
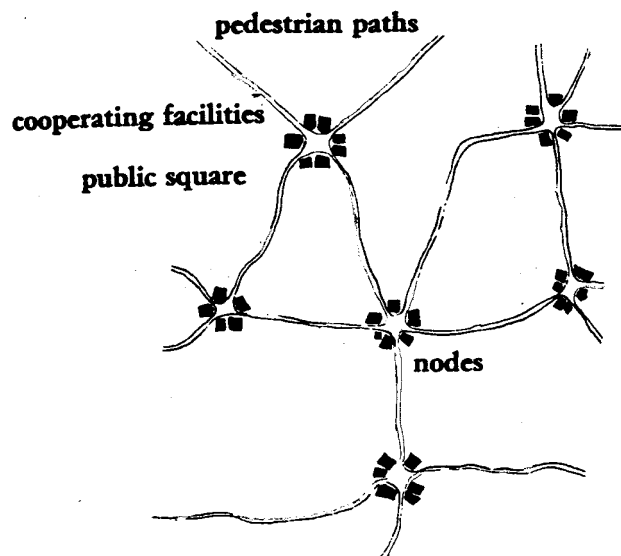

Figure 5. Neighborhood Activity Nodes (Alexander, 1977, Reprinted by the permission of Oxford University Press.)

<u>Comparison of neighborhood and workplace neighborhood.</u> Workplace neighborhood is derived from the concept of neighborhood. As discussed previously, some interior designers borrowed this concept from city planning to promote human interaction in workplace, and hence to shape a humanistic work environment.

From the previous case studies which applied this concept and the review of the neighborhood concept itself, some common features between workplace neighborhood and neighborhood can be summarized:

1. Both neighborhood and workplace neighborhood members have collective responsibilities and a common goal to their neighborhood.

2. Both have to share spaces to some extent.

3. Both rely on a familiar association established by interaction, and both need human interaction settings.

4. Both require appropriate spaces for different kinds of activities involving different numbers of people from single person to large group.

5. Both need a good balance between private and public.

6. Both of them need a good balance between order and diversity in terms of the whole spatial relationships within the neighborhood.

However, the working environment is different from the living environment. Consequently, there are differences between neighborhood and workplace neighborhood:

1. Workplace neighborhood has a much clearer common goal, and each member has a clear responsibility. Thus, the workplace neighborhood tends to be more structured than the neighborhood.

2. Workplace neighborhood members are among a certain range of age, education level, professional area, and thus have less diversity and complexity than neighborhood members.

3. Workplace neighborhood discussed here is an interior environment while neighborhood normally refers to an exterior environment. Thus, some important

issues of neighborhood such as safety, and interaction with the natural environment

may be minor in the case of workplace neighborhood.

The activities in a neighborhood are mostly spontaneous. In contrast, the activities in a

workplace neighborhood are mostly planned and structured.

User needs check list for workplace neighborhood. According to the analysis of

the similarities and differences between neighborhood and workplace neighborhood,

Hester's (1984) "neighborhood user needs checklist" was revised into a "workplace

neighborhood user needs check list" as follows:

- Appropriate human interactions

- Appropriate activity settings

- Physical comfort

- Psychological comfort

- Functional efficiency

- Aesthetic appeal

- Symbolic ownership

- Policy on use

- Cost

This check list was used as a guideline for the programming of this project. The

questions in the survey were derived from this list to collect sufficient data to establish

the basis for the workplace neighborhood design development. Also, this check list was

used to develop the questions in the design evaluation form so as to find out if the

workplace neighborhood designed had achieved its original purpose.

Research on workplace human interaction

Communication. Sundstrom's (1986) research had many findings on how people

communicate in workplace. First, his reaearch on physical accessibility and

communication suggested that "inter-workspace proximity, and a lack of barriers between

workspaces would increase the chances of informal conversation among neighbors.

However, proximity and accessibility of workplaces seemed to have little relevance to

formal communication" (p. 268). Second, his study found the physical enclosure of work spaces was unrelated to the amount of formal communication. However, the physical enclosure was associated with the ability to hold confidential conferences. Third, his research on open offices suggested that the visual accessibility of workspaces was not consistently associated with communication. It was associated in some cases with informal conversation or discretionary formal contacts. However, a lack of enclosure often made confidential exchange difficult. Fourth, in non-territorial offices, nonassigned work stations brought an increase in communication through a combination of accessibility and mobility. "The best explanation for this finding probably is that each employee's neighbors changed from time to time, and employees tended to talk to their more numerous neighbors" (Sundstrom & Sundstrom, 1986, p. 268).

  <u>Gathering place.</u> Designers can do a great deal to facilitate informal contact through the provision of convenient "gathering places" located just off the major pathways that people use in their daily work (Sundstrom & Sundstrom, 1986, p. 286). "Gathering places may contain items that give people work-related reason to be there: mail boxes, copying machines, reference materials, bulletin boards, special computer terminals, or such. They also provide facilities for work break: coffee pots, water coolers, vending machines, and other sources for food and drink" (Sundstrom & Sundstrom, 1986, p. 286).

  The research on workplace human interactions discussed above helped to generate some ideas based on the workplace neighborhood concept in the space prototype design of this project. For example, the gathering place concept in the workplace human interaction research helped to make the activity node idea in the neighborhood concept fit into the workplace situation.